Situation Awareness (SA) for Project Team Members

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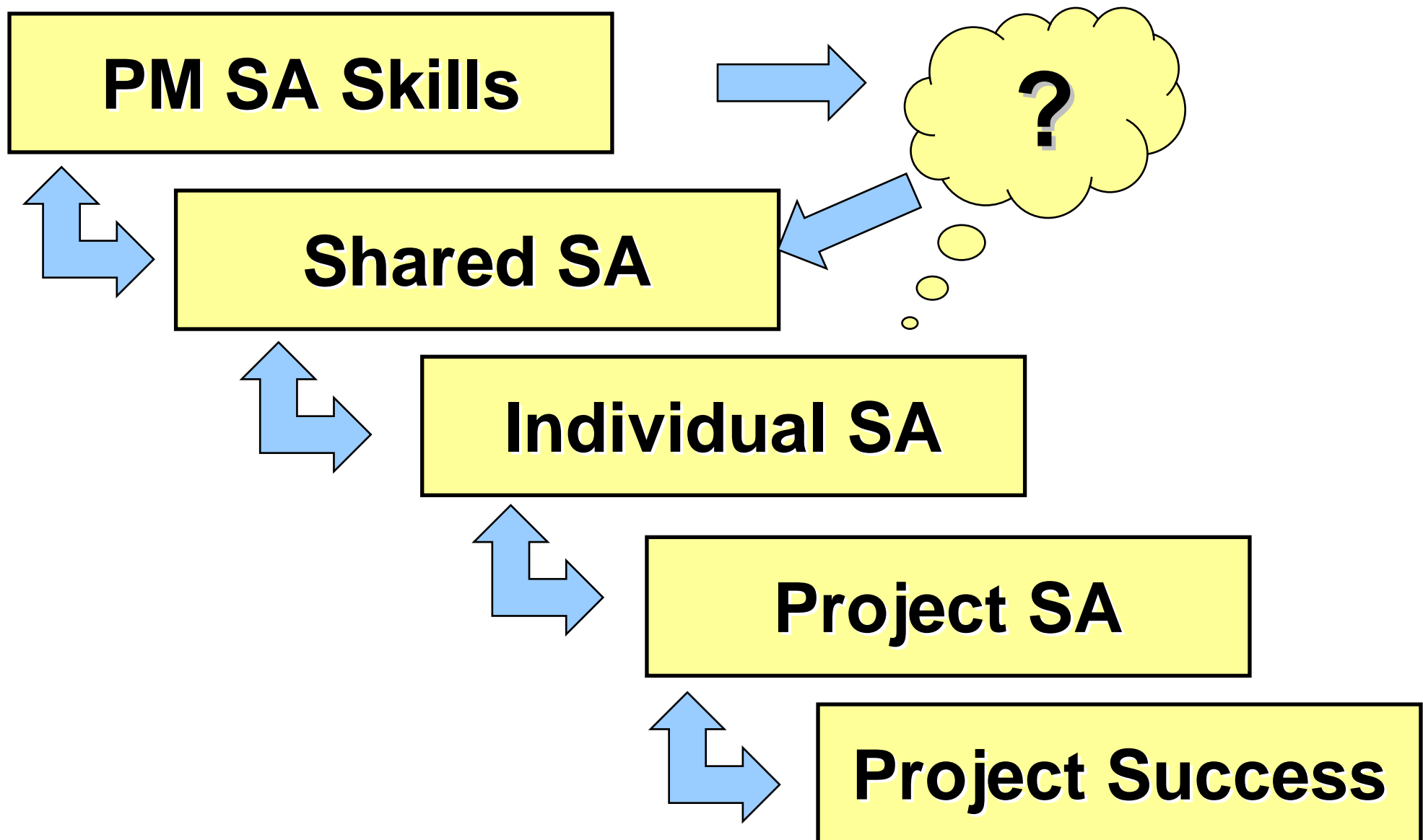
william.s.o'keefe@usa-spaceops.com

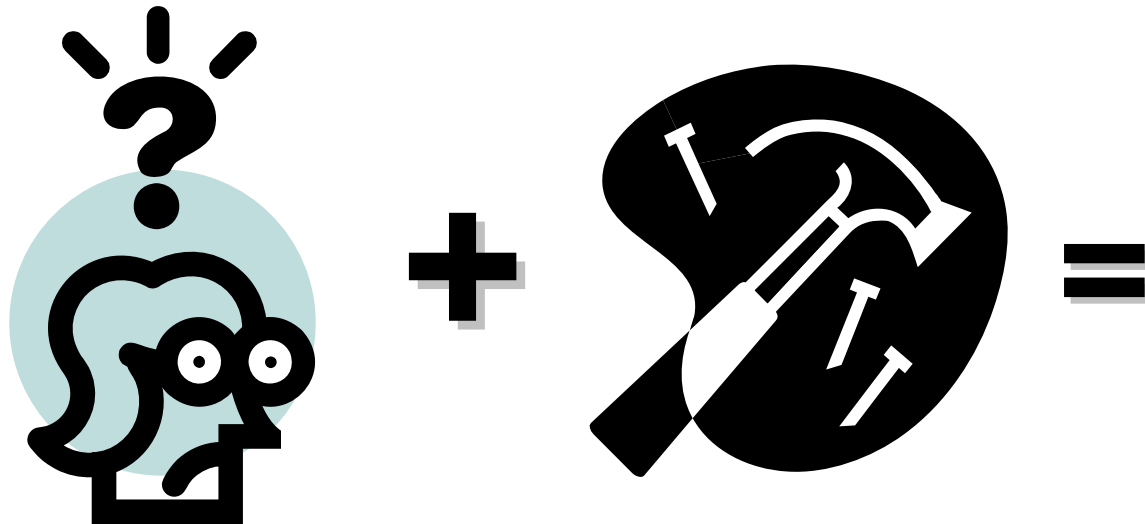**(713) 725-7036**

NASA Project Management Challenge 2007

Feb 6-7, 2007

Is Situation Awareness (SA) Important?

PM SA Skills

?

Shared SA

Individual SA

Project SA

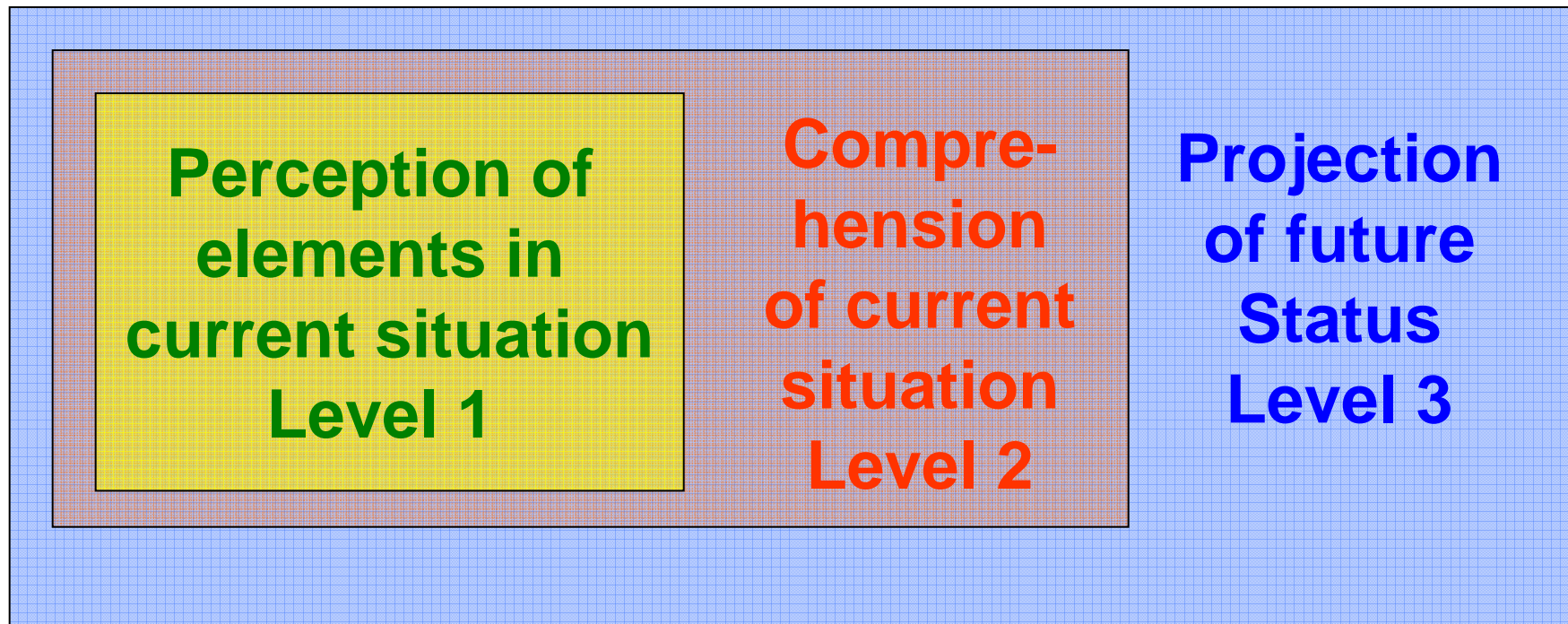Project Success

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Overview

- **Define Individual and Team Situation Awareness (SA)**

- **Turn Individual SAs into Team SA**

- **Good Team SA tools**

- **Use the "Questioning Look"**

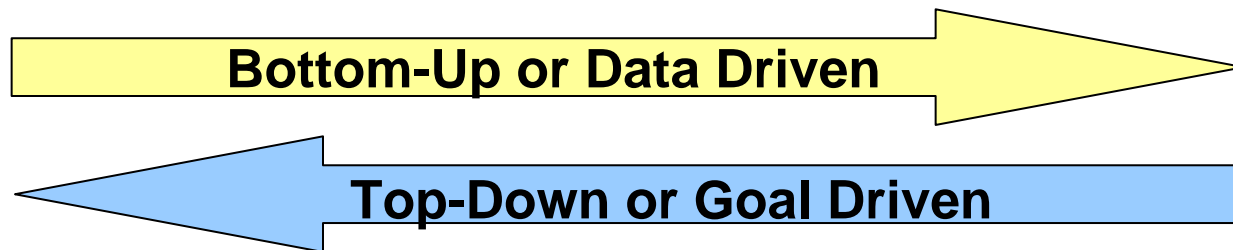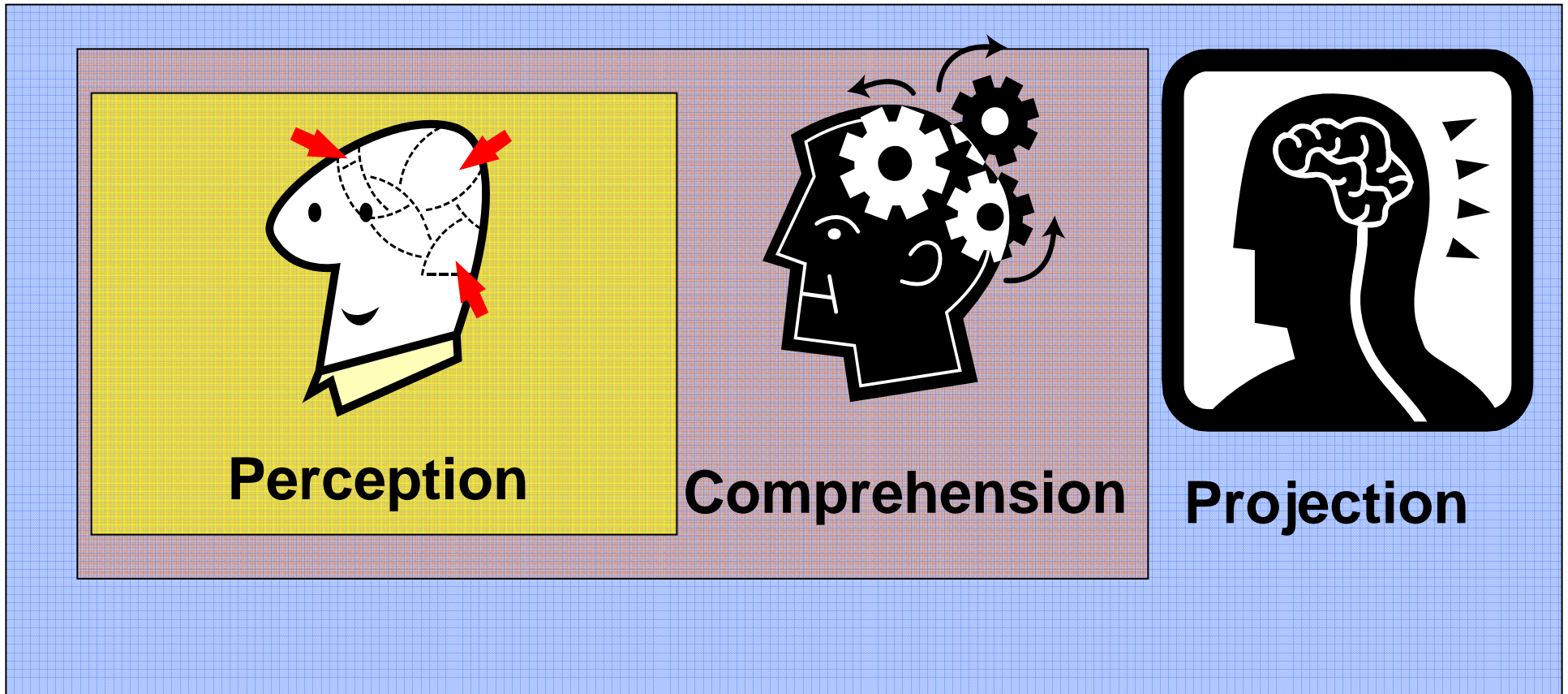# Definition (from Dr. M. Endsley)

Situation Awareness is the <u>perception</u> of the elements in the environment within a volume of time and space, the <u>comprehension</u> of their meaning and the <u>projection</u> of their status in the near future

**Perception of elements in current situation
Level 1**

**Compre-hension of current situation
Level 2**

**Projection of future Status
Level 3**

Situation Awareness Levels

Perception

Comprehension

Projection

Bottom-Up or Data Driven

Top-Down or Goal Driven

Role of Goals & Mental Models in SA

Mental Model drives SA

Perception of RID Report

Compre-hension of open RIDs

Projection of RID Completion

SA drives Goal

ID	Task Name										
		arter							4th Quarte		
		E	B	M	E	B	M	E	B	M	E
1	**HW PDR Products Approved**										
2	Product Outline Approved										
3	Product 1st draft redlined										
4	Product final draft redlined										
5	Product RIDs incoroporated										
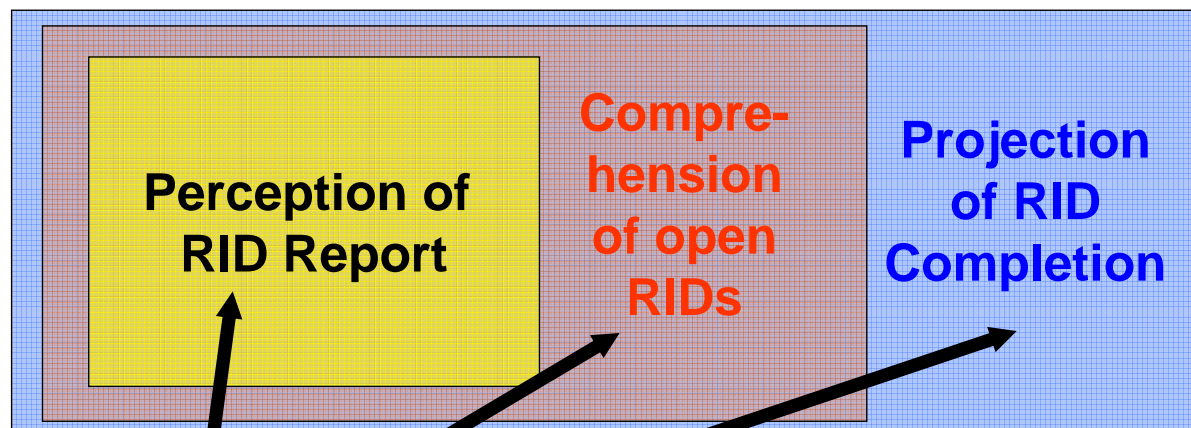
Preliminary Design Review (PDR)

Goal drives Mental Model

Distributed vs Shared SA

Hardware Design Team SA

Software Design Team SA

Team Shared SA

SE&I Team SA

Project Manager SA
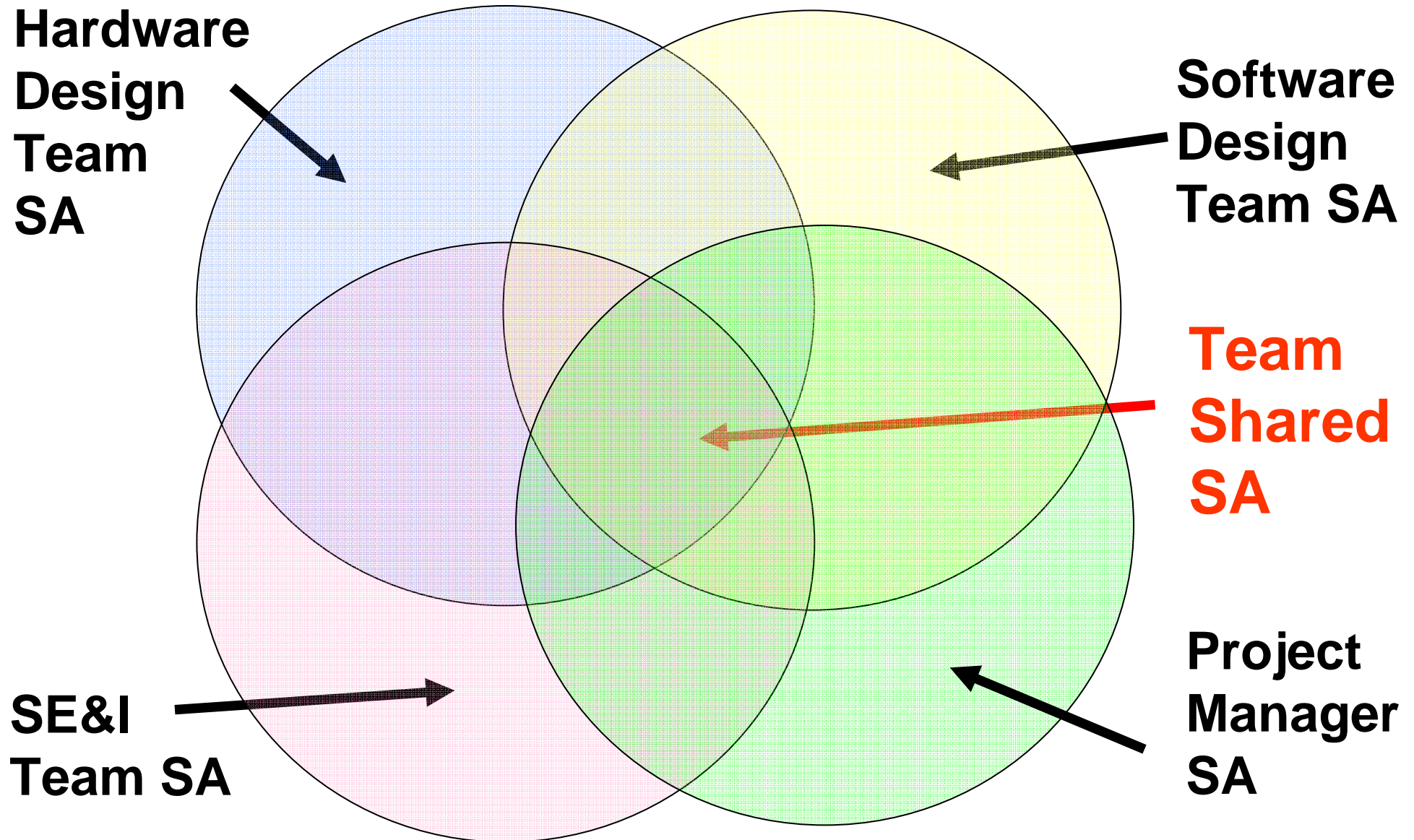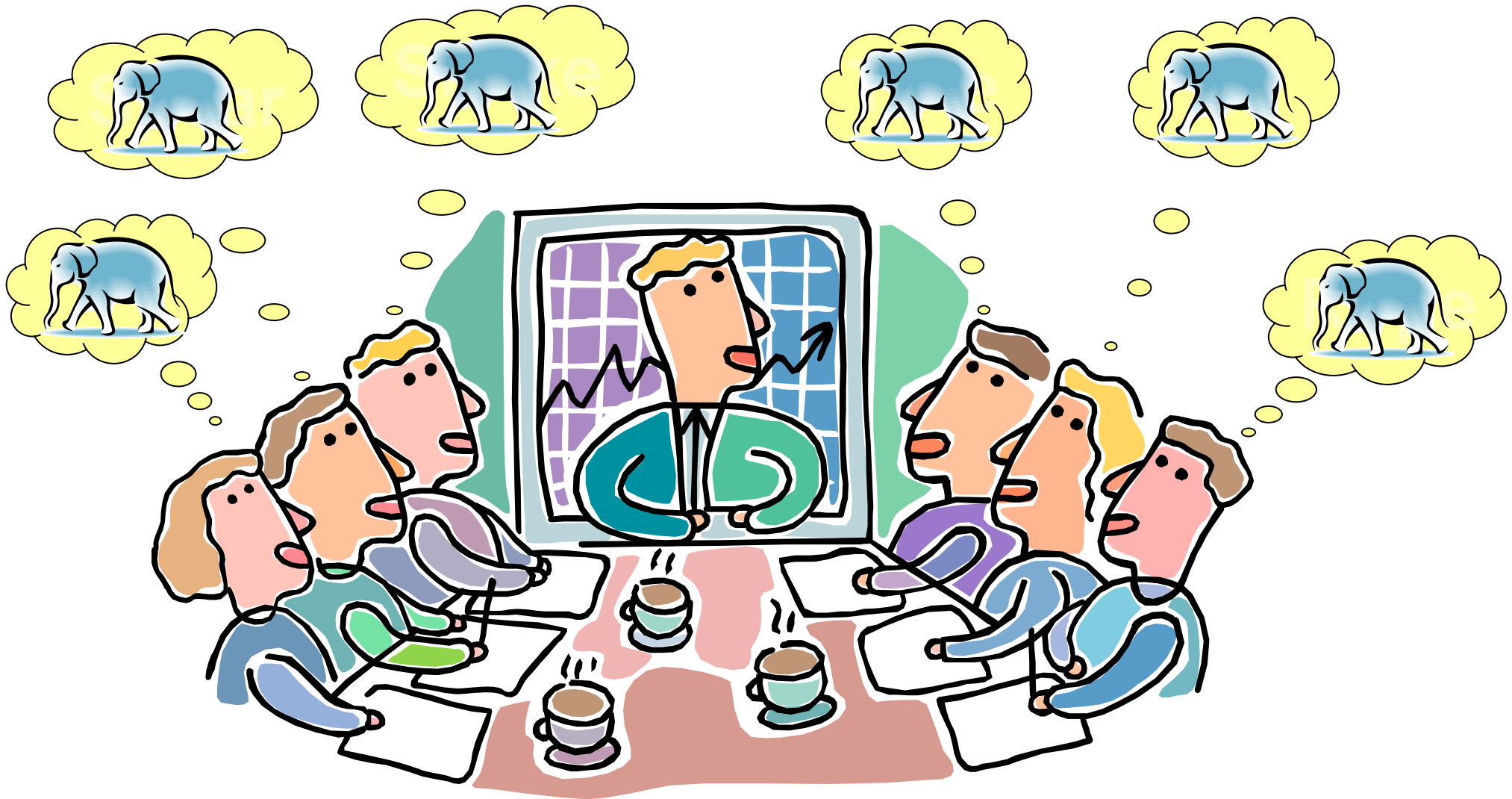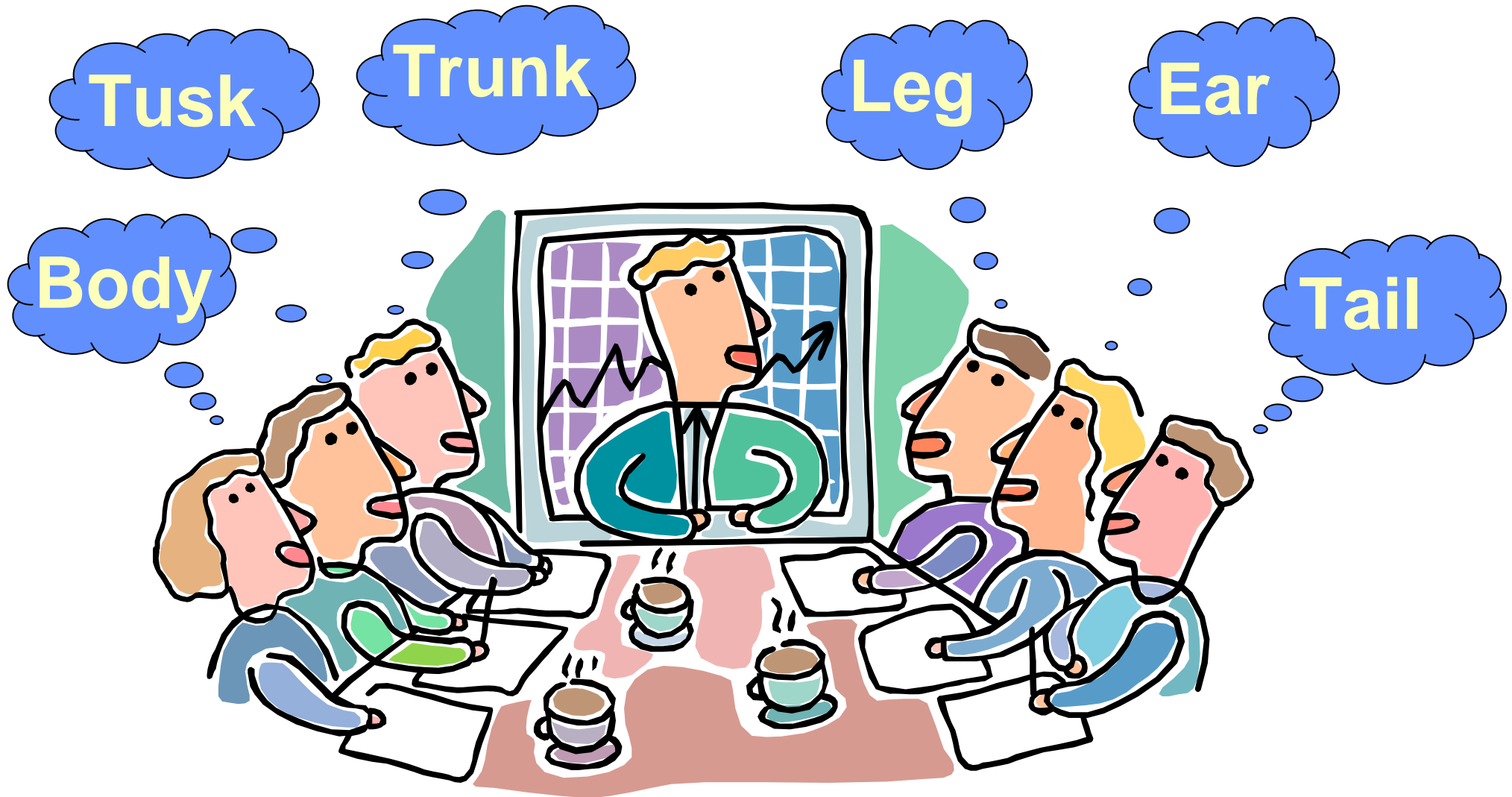
Good Teams turn individual SA…
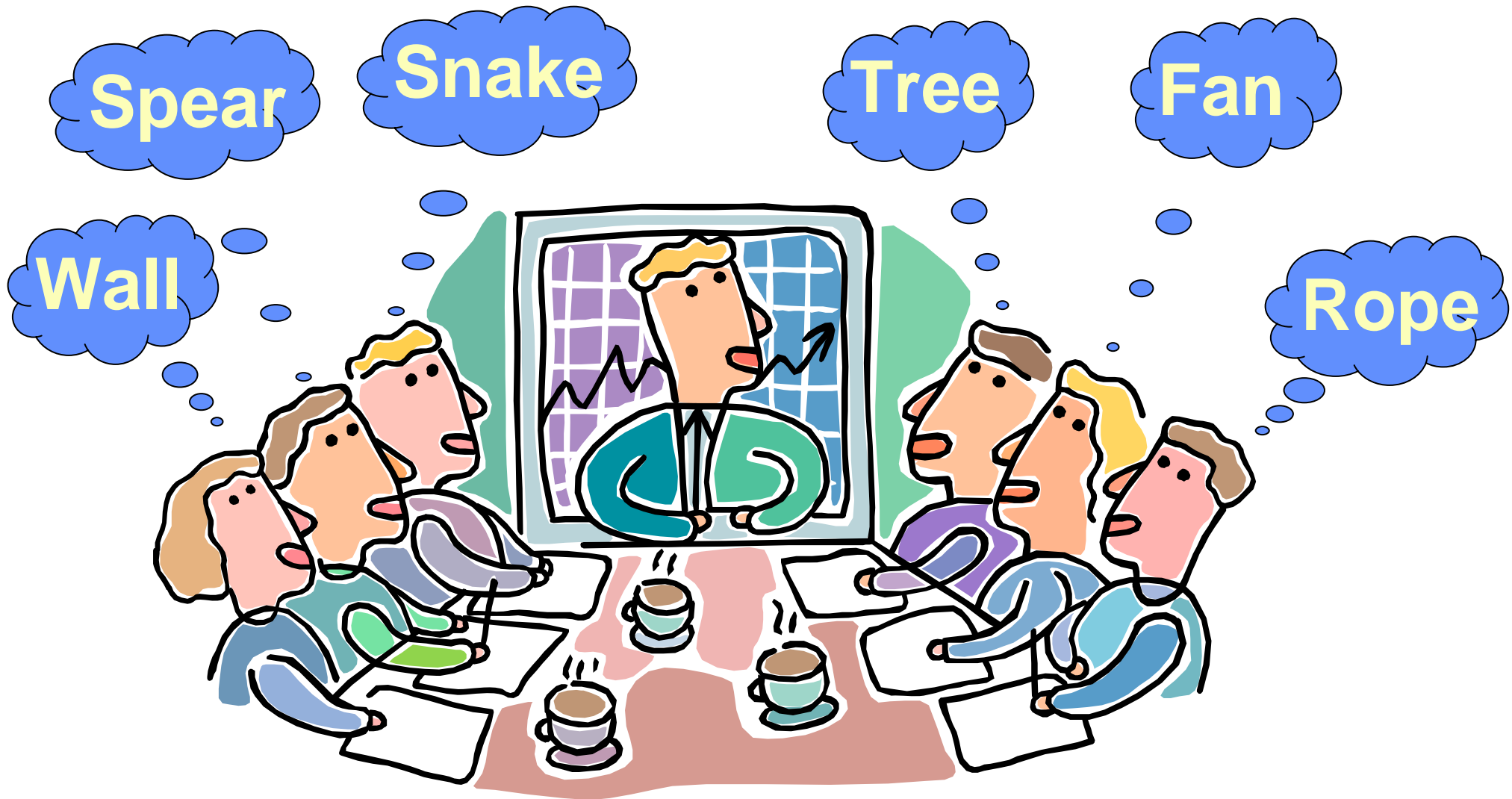
.... into Team SA ...

.. which gives context to individual SA

Why so tough to get good team SA?

- **Too little time**

- **Too many teams**

- **Constant change**

- **Complexity**

- **Stressors**

- **"Can Do" people**

How does Individual SA become Team SA?

Bottoms-Up Data Driven Communication →

| HW Team's SA |
| SW Team's SA |
| SE&I Team's SA |
| PM's SA |

**Then magic happens?
No, then good Project Management happens !**

Shared Team SA

Team Mental Model

Team Goal

← **Top-Down Goal Driven Communication**
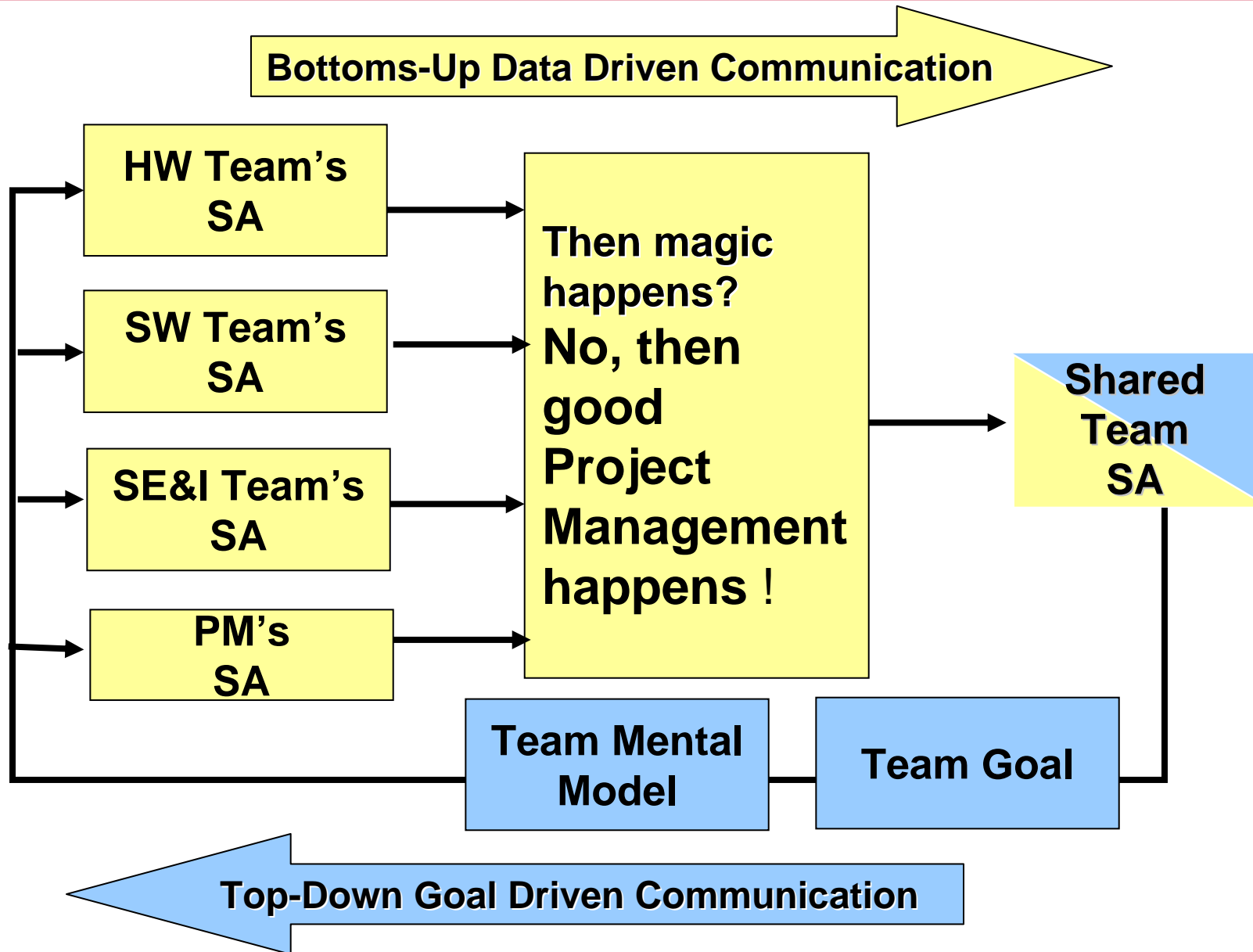
Low Hanging Fruit

You already made sure that they have

- **Enough time**

- **Well designed tools and products**

- **Proper environment**

- **Training**

- **Mentoring**

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Teams w/ good SA do

1. Prepare more

2. Focus more on comprehending and projecting

Teams w/ good SA do

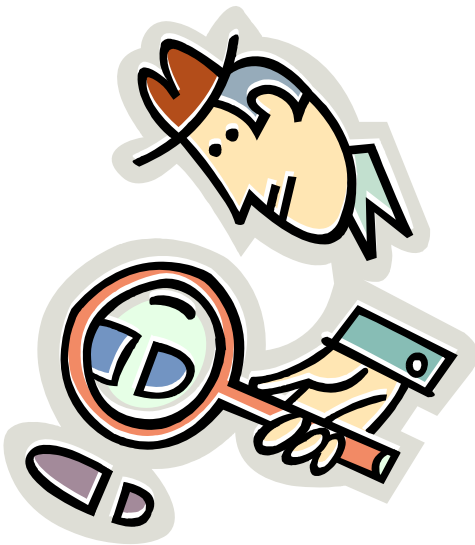3. Pay attention to the actions of others

4. Verbalize decisions and actions

Teams w/ good SA do

5. Attend to more cues and seek out more information

6. Plan for distractions/ interruptions

Teams w/ good SA do

7. "Buy time"

8. Do better risk assessment, especially as related to their skill

9. Feedback

Tool for PM to build Team SA?

Maintain (Self/ Team) Situation Awareness

(modified from ESSAI)

Communicate

Manage tasks/ workload and prioritize

Interact with processes

Prepare & Review
- Set objectives for team
- Not too focused on one goal
- Consider human limitations & pitfalls
- Review own & team's performance in meetings

Notice and Perceive
- Seek information
- Pay attention to subtle changes & weak signals
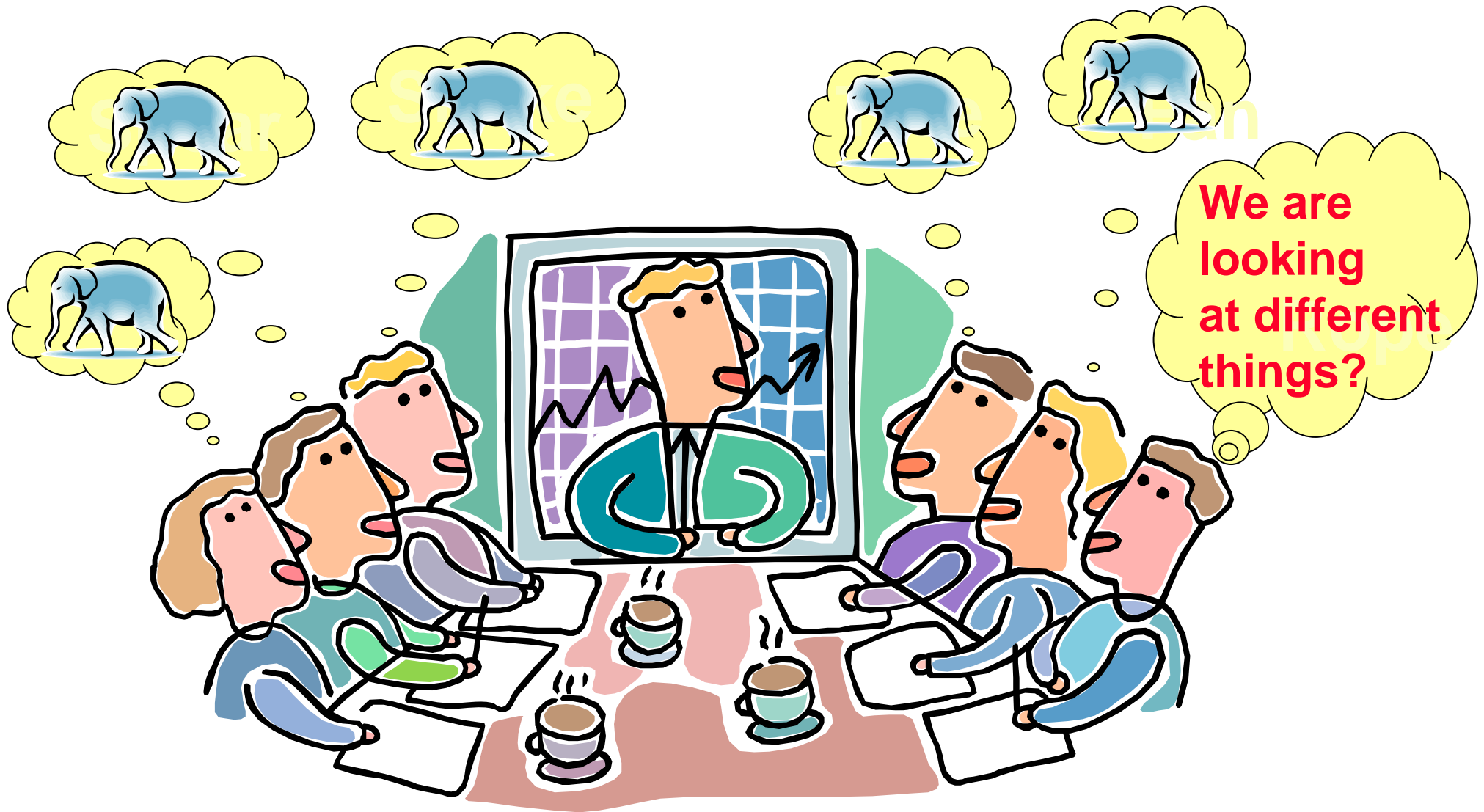- Validate info by double cross-checking and applying rules of thumb

Comprehend and Interpret
- Build picture of current situation
- Validate picture by checking for contradictory elements & applying rules of thumb
- Assess whether picture of current situation conforms to desired picture
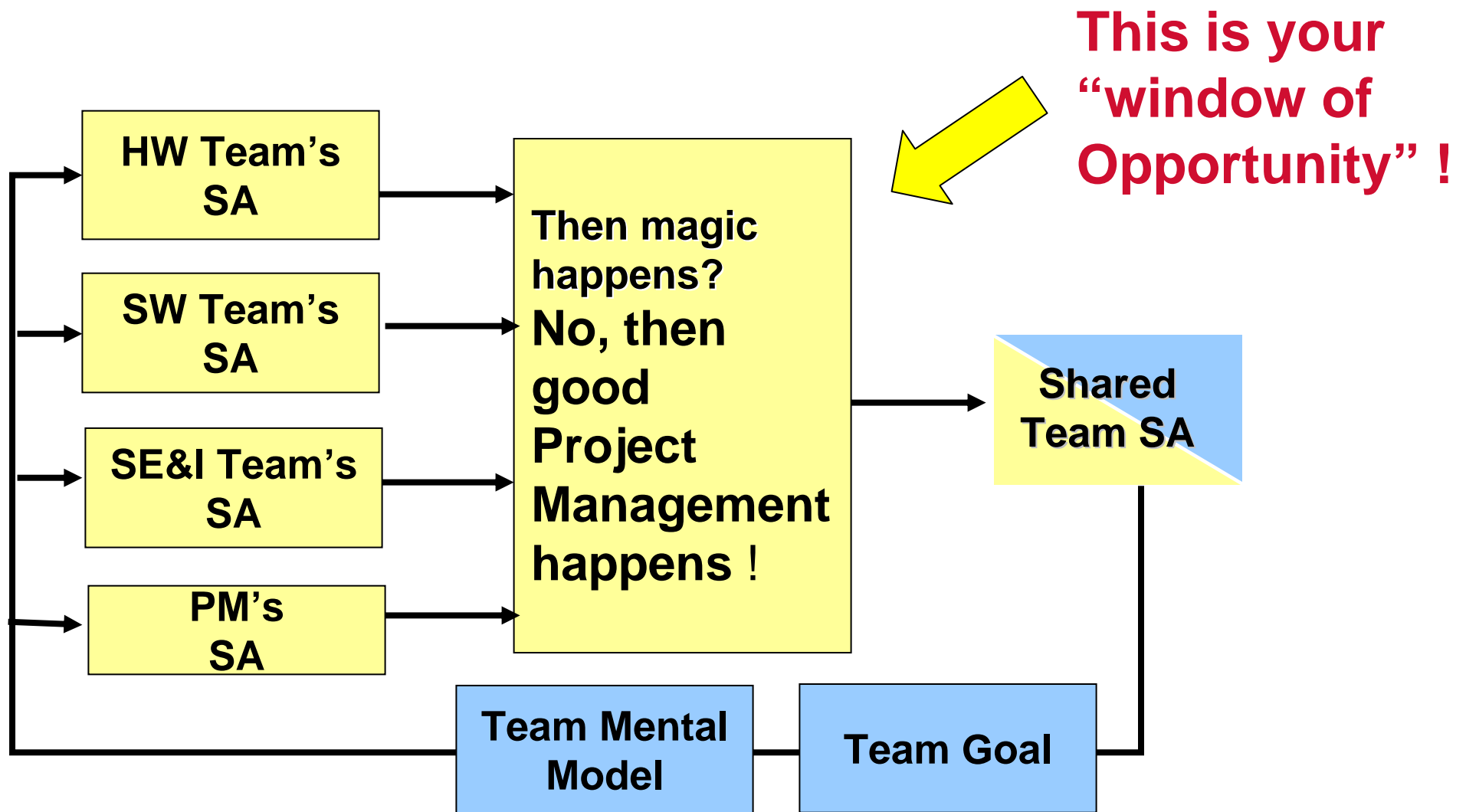
Project and Think Ahead
- Build picture of future situation
- Assess whether picture of future situation conforms to planning
- Set markers for confirmation
- Plan for contingencies

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Window of Opportunity

Best chance to find bad team SA?

This is your "window of Opportunity" !

HW Team's SA

SW Team's SA

SE&I Team's SA

PM's SA

Then magic happens?
No, then good Project Management happens !

Shared Team SA

Team Mental Model

Team Goal

Another definition of SA

Seeing how things are really going despite our expectations

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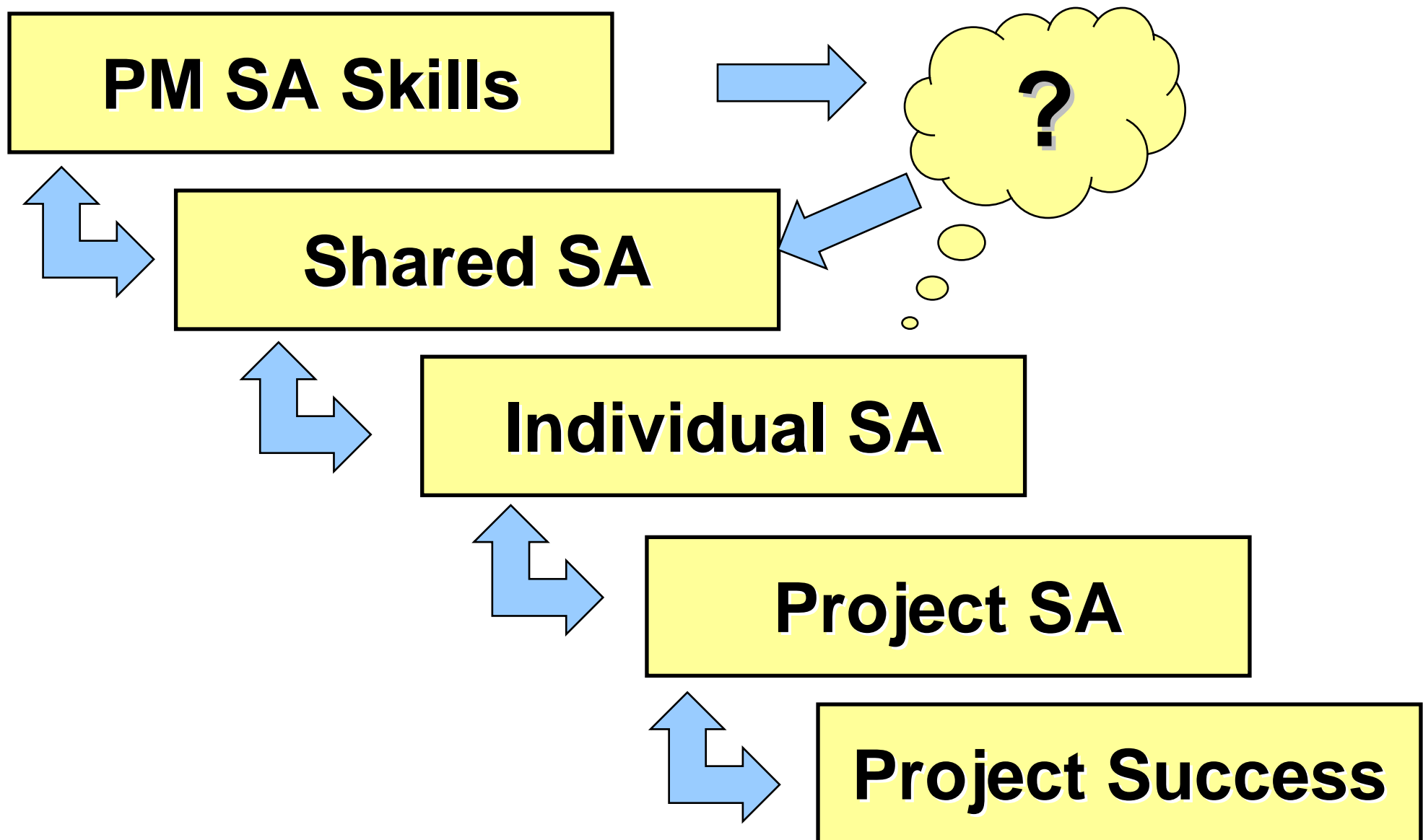
References

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  - **Theoretical Underpinnings of Situation Awareness: A Critical Review**
  - **Training for Situation Awareness**
  - **Modeling and Measuring Situation Awareness in the Infantry Operational Environment**
  - **Presentation to 'Situation Awareness in Control Centers for Real-time Operations of Power Systems and Markets' course**
  - **Designing for Situation Awareness**
- **S. Banbury & S. Tremblay:**
  - **A Cognitive Approach to Situation Awareness: Theory and Application**
- **Albert A. Nofi**
  - **Defining and Measuring Shared Situational Awareness" (CRM D0002895.A1 Final, dated Nov. 2000)**

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Acronyms

- **HW**   Hardware
- **PM**   Project Manager

           Project Management

- **RID**   Review Item Disposition
- **SA**   Situation Awareness
- **SE&I**   System Engineering & Integration
- **SW**   Software
- **USA**   United Space Alliance

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